# 大同大學 102 學年度　　轉學入學考試試題

考試科目:統計學　　所別:資訊經營學系　　第全頁

註:本次考試　不可以參考自己的書籍及筆記；　不可以使用字典；　可以使用計算器。

1. The monthly incomes from a random sample of workers in a factory are shown below. Monthly Income (In $1,000): 4.0, 5.0, 7.0, 4.0, 6.0, 6.0, 7.0, 9.0. (30%)

a. Compute the standard error of the mean (in dollars).
b. Compute the margin of error (in dollars) at 95% confidence.
c. Compute a 95% confidence interval for the mean of the population. Assume the population has a normal distribution. Give your answer in dollars.

2. The manager of a department store wants to determine what proportion of people who enter the store use the store's credit cards for their purchases. What size sample should he take so that at 95% confidence the error will not be more than 6%? (10%)

3. A student believes that the average grade on the statistics final examination was 87. A sample of 36 final examinations was taken. The average grade in the sample was 83.96 with a standard deviation of 12. (30%)

a. State the null and alternative hypotheses.
b. Using the critical value approach, test the hypotheses at the 5% level of significance.
c. Using the *p*-value approach, test the hypotheses at the 5% level of significance.

4. An automobile manufacturer stated that it will be willing to mass produce electric-powered cars if more than 30% of potential buyers indicate they will purchase the newly designed electric cars. In a sample of 500 potential buyers, 160 indicated that they would buy such a product. (30%)

a. State the hypotheses for this problem
b. Compute the standard error of sample proportion.
c. Compute the test statistic.
d. At 95% confidence, what is your conclusion? Should the manufacturer produce the new electric powered car?

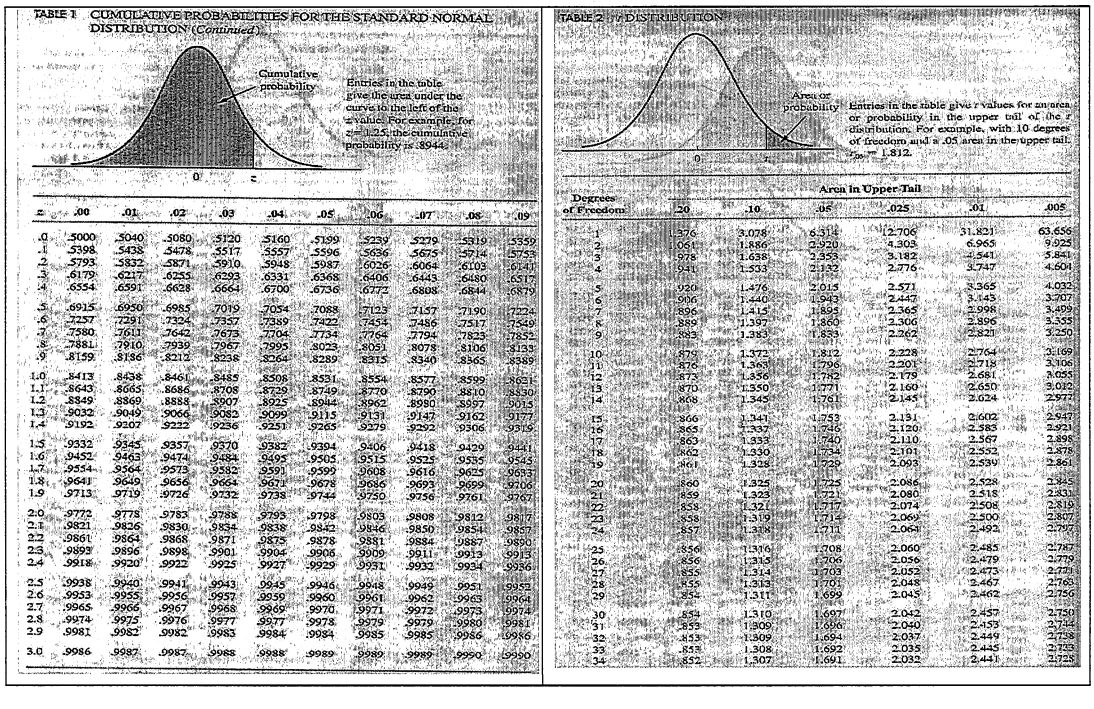

TABLE 1 CUMULATIVE PROBABILITIES FOR THE STANDARD NORMAL DISTRIBUTION (*Continued*)



| z | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| .0 | .5000 | .5040 | .5080 | .5120 | .5160 | .5199 | .5239 | .5279 | .5319 | .5359 |
| .1 | .5398 | .5438 | .5478 | .5517 | .5557 | .5596 | .5636 | .5675 | .5714 | .5753 |
| .2 | .5793 | .5832 | .5871 | .5910 | .5948 | .5987 | .6026 | .6064 | .6103 | .6141 |
| .3 | .6179 | .6217 | .6255 | .6293 | .6331 | .6368 | .6406 | .6443 | .6480 | .6517 |
| .4 | .6554 | .6591 | .6628 | .6664 | .6700 | .6736 | .6772 | .6808 | .6844 | .6879 |
| .5 | .6915 | .6950 | .6985 | .7019 | .7054 | .7088 | .7123 | .7157 | .7190 | .7224 |
| .6 | .7257 | .7291 | .7324 | .7357 | .7389 | .7422 | .7454 | .7486 | .7517 | .7549 |
| .7 | .7580 | .7611 | .7642 | .7673 | .7704 | .7734 | .7764 | .7794 | .7823 | .7852 |
| .8 | .7881 | .7910 | .7939 | .7967 | .7995 | .8023 | .8051 | .8078 | .8106 | .8133 |
| .9 | .8159 | .8186 | .8212 | .8238 | .8264 | .8289 | .8315 | .8340 | .8365 | .8389 |
| 1.0 | .8413 | .8438 | .8461 | .8485 | .8508 | .8531 | .8554 | .8577 | .8599 | .8621 |
| 1.1 | .8643 | .8665 | .8686 | .8708 | .8729 | .8749 | .8770 | .8790 | .8810 | .8830 |
| 1.2 | .8849 | .8869 | .8888 | .8907 | .8925 | .8944 | .8962 | .8980 | .8997 | .9015 |
| 1.3 | .9032 | .9049 | .9066 | .9082 | .9099 | .9115 | .9131 | .9147 | .9162 | .9177 |
| 1.4 | .9192 | .9207 | .9222 | .9236 | .9251 | .9265 | .9279 | .9292 | .9306 | .9319 |
| 1.5 | .9332 | .9345 | .9357 | .9370 | .9382 | .9394 | .9406 | .9418 | .9429 | .9441 |
| 1.6 | .9452 | .9463 | .9474 | .9484 | .9495 | .9505 | .9515 | .9525 | .9535 | .9545 |
| 1.7 | .9554 | .9564 | .9573 | .9582 | .9591 | .9599 | .9608 | .9616 | .9625 | .9633 |
| 1.8 | .9641 | .9649 | .9656 | .9664 | .9671 | .9678 | .9686 | .9693 | .9699 | .9706 |
| 1.9 | .9713 | .9719 | .9726 | .9732 | .9738 | .9744 | .9750 | .9756 | .9761 | .9767 |
| 2.0 | .9772 | .9778 | .9783 | .9788 | .9793 | .9798 | .9803 | .9808 | .9812 | .9817 |
| 2.1 | .9821 | .9826 | .9830 | .9834 | .9838 | .9842 | .9846 | .9850 | .9854 | .9857 |
| 2.2 | .9861 | .9864 | .9868 | .9871 | .9875 | .9878 | .9881 | .9884 | .9887 | .9890 |
| 2.3 | .9893 | .9896 | .9898 | .9901 | .9904 | .9906 | .9909 | .9911 | .9913 | .9916 |
| 2.4 | .9918 | .9920 | .9922 | .9925 | .9927 | .9929 | .9931 | .9932 | .9934 | .9936 |
| 2.5 | .9938 | .9940 | .9941 | .9943 | .9945 | .9946 | .9948 | .9949 | .9951 | .9952 |
| 2.6 | .9953 | .9955 | .9956 | .9957 | .9959 | .9960 | .9961 | .9962 | .9963 | .9964 |
| 2.7 | .9965 | .9966 | .9967 | .9968 | .9969 | .9970 | .9971 | .9972 | .9973 | .9974 |
| 2.8 | .9974 | .9975 | .9976 | .9977 | .9977 | .9978 | .9979 | .9979 | .9980 | .9981 |
| 2.9 | .9981 | .9982 | .9982 | .9983 | .9984 | .9984 | .9985 | .9985 | .9986 | .9986 |
| 3.0 | .9986 | .9987 | .9987 | .9988 | .9988 | .9989 | .9989 | .9989 | .9990 | .9990 |

TABLE 2 *t* DISTRIBUTION



| Degrees of Freedom | Area in Upper Tail .20 | .10 | .05 | .025 | .01 | .005 |
|---|---|---|---|---|---|---|
| 1 | .325 | 3.078 | 6.314 | 12.706 | 31.821 | 63.656 |
| 2 | .289 | 1.886 | 2.920 | 4.303 | 6.965 | 9.925 |
| 3 | .277 | 1.638 | 2.353 | 3.182 | 4.541 | 5.841 |
| 4 | .271 | 1.533 | 2.132 | 2.776 | 3.747 | 4.604 |
| 5 | .267 | 1.476 | 2.015 | 2.571 | 3.365 | 4.032 |
| 6 | .265 | 1.440 | 1.943 | 2.447 | 3.143 | 3.707 |
| 7 | .263 | 1.415 | 1.895 | 2.365 | 2.998 | 3.499 |
| 8 | .262 | 1.397 | 1.860 | 2.306 | 2.896 | 3.355 |
| 9 | .261 | 1.383 | 1.833 | 2.262 | 2.821 | 3.250 |
| 10 | .260 | 1.372 | 1.812 | 2.228 | 2.764 | 3.169 |
| 11 | .260 | 1.363 | 1.796 | 2.201 | 2.718 | 3.106 |
| 12 | .259 | 1.356 | 1.782 | 2.179 | 2.681 | 3.055 |
| 13 | .259 | 1.350 | 1.771 | 2.160 | 2.650 | 3.012 |
| 14 | .258 | 1.345 | 1.761 | 2.145 | 2.624 | 2.977 |
| 15 | .258 | 1.341 | 1.753 | 2.131 | 2.602 | 2.947 |
| 16 | .258 | 1.337 | 1.746 | 2.120 | 2.583 | 2.921 |
| 17 | .257 | 1.333 | 1.740 | 2.110 | 2.567 | 2.898 |
| 18 | .257 | 1.330 | 1.734 | 2.101 | 2.552 | 2.878 |
| 19 | .257 | 1.328 | 1.729 | 2.093 | 2.539 | 2.861 |
| 20 | .257 | 1.325 | 1.725 | 2.086 | 2.528 | 2.845 |
| 21 | .257 | 1.323 | 1.721 | 2.080 | 2.518 | 2.831 |
| 22 | .256 | 1.321 | 1.717 | 2.074 | 2.508 | 2.819 |
| 23 | .256 | 1.319 | 1.714 | 2.069 | 2.500 | 2.807 |
| 24 | .256 | 1.318 | 1.711 | 2.064 | 2.492 | 2.797 |
| 25 | .256 | 1.316 | 1.708 | 2.060 | 2.485 | 2.787 |
| 26 | .256 | 1.315 | 1.706 | 2.056 | 2.479 | 2.779 |
| 27 | .256 | 1.314 | 1.703 | 2.052 | 2.473 | 2.771 |
| 28 | .256 | 1.313 | 1.701 | 2.048 | 2.467 | 2.763 |
| 29 | .256 | 1.311 | 1.699 | 2.045 | 2.462 | 2.756 |
| 30 | .256 | 1.310 | 1.697 | 2.042 | 2.457 | 2.750 |
| 31 | .256 | 1.309 | 1.696 | 2.040 | 2.453 | 2.744 |
| 32 | .255 | 1.309 | 1.694 | 2.037 | 2.449 | 2.738 |
| 33 | .255 | 1.308 | 1.692 | 2.035 | 2.445 | 2.733 |
| 34 | .255 | 1.307 | 1.691 | 2.032 | 2.441 | 2.728 |